

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

CARRUM TECHNOLOGIES, LLC,

Plaintiff,

v.

FCA US LLC,

Defendant.

Civil Action No. 18-1646-RGA

CARRUM TECHNOLOGIES, LLC,

Plaintiff/Counterclaimant-Defendant,

v.

Civil Action No. 18-1647-RGA

FORD MOTOR COMPANY,

Defendant/Counterclaimant.

MEMORANDUM OPINION

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ANDREWS, U.S. DISTRICT JUDGE:

Before me is the issue of claim construction of multiple terms in U.S. Patent No. 7,925,416 (“the ’416 patent”). The parties submitted a Joint Claim Construction Brief (D.I. 87)¹ and Appendix (D.I. 88), and I heard oral argument on October 26, 2021. (References to the transcript of the oral argument are indicated by “Tr.”).

I. BACKGROUND

The ’416 patent discloses “a system and method for enabling a vehicle having adaptive cruise control to reduce its speed in a turn according to the vehicle’s position within the turn as well as ignoring objects detected during the turn that are not in the vehicle’s path.” (’416 patent, Abstract). Per the parties, the following claims are representative, and I have italicized the disputed terms.

Claim 11

11. The system of claim 10 wherein said object detection sensor includes *means for generating an object range signal corresponding to a distance between the vehicle and the object; and an object angle signal corresponding to the object’s angle in relation to the vehicle.*

Claim 12

12. The system of claim 11 wherein said controller includes both *means for measuring an object range rate corresponding to the rate in which the distance between the vehicle and the object is changing, and means for determining a curvature corresponding to a radius of curvature of the vehicle path.*

II. LEGAL STANDARD

“It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312

¹ Citations to the docket are to Civil Action No. 18-1646.

(Fed. Cir. 2005) (en banc) (internal quotation marks omitted). “[T]here is no magic formula or catechism for conducting claim construction.’ Instead, the court is free to attach the appropriate weight to appropriate sources ‘in light of the statutes and policies that inform patent law.’”

SoftView LLC v. Apple Inc., 2013 WL 4758195, at *1 (D. Del. Sept. 4, 2013) (quoting *Phillips*, 415 F.3d at 1324) (alteration in original). When construing patent claims, a court considers the literal language of the claim, the patent specification, and the prosecution history. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 977–80 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996). Of these sources, “the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1315 (internal quotation marks omitted).

“[T]he words of a claim are generally given their ordinary and customary meaning. . . . [Which is] the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Id.* at 1312–13 (citations and internal quotation marks omitted). “[T]he ordinary meaning of a claim term is its meaning to [an] ordinary artisan after reading the entire patent.” *Id.* at 1321 (internal quotation marks omitted). “In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.” *Id.* at 1314.

When a court relies solely upon the intrinsic evidence—the patent claims, the specification, and the prosecution history—the court’s construction is a determination of law. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 331 (2015). The court may also make factual findings based upon consideration of extrinsic evidence, which “consists of all evidence

external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” *Phillips*, 415 F.3d at 1317–19 (internal quotation marks omitted). Extrinsic evidence may assist the court in understanding the underlying technology, the meaning of terms to one skilled in the art, and how the invention works. *Id.* Extrinsic evidence, however, is less reliable and less useful in claim construction than the patent and its prosecution history. *Id.*

Means-plus-function claiming allows a patentee to express a claim limitation by reciting a function to be performed rather than a structure for performing that function. Such claims are governed by 35 U.S.C. § 112, ¶ 6,² which states:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

When a claim uses the term “means,” there is a rebuttable presumption that § 112, ¶ 6 applies. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (en banc in relevant part). This presumption can be overcome if “the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure.” *Id.* at 1349. “The ultimate question is whether ‘the claim language, read in light of the specification, recites sufficiently definite structure to avoid § 112, ¶ 6.’” *MTD Prod. Inc. v. Iancu*, 933 F.3d 1336, 1342 (Fed. Cir. 2019) (quoting *Media Rights Techs. Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1372 (Fed. Cir. 2015)). “Sufficient structure exists when the claim language specifies the exact structure that performs the functions in question without need to

² The priority date of the ’416 patent is pre-AIA. The AIA “renumbered” the provision to be § 112(f).

resort to other portions of the specification or extrinsic evidence for an adequate understanding of the structure.” *TriMed, Inc. v. Stryker Corp.*, 514 F.3d 1256, 1259–60 (Fed. Cir. 2008).

If § 112, ¶ 6 applies, the court must first identify the claimed function. *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311 (Fed. Cir. 2012). Next, “the court must identify the corresponding structure in the written description of the patent that performs the function.” *Id.*

III. CONSTRUCTION OF AGREED-UPON TERM

I adopt the following agreed-upon construction:

| Claim Term | Construction |
|---|--|
| “according to a vehicle position in the turn” (claim 10) | “according to the position of the vehicle along the curve of the turn” |

III. CONSTRUCTION OF DISPUTED TERMS

1. “means for generating an object range signal corresponding to a distance between the vehicle and the object; and an object angle signal corresponding to the object’s angle in relation to the vehicle” (claim 11)

- a. *Plaintiff’s proposed construction:* this term is not a means-plus-function limitation because sufficient structure is provided within the claim

Plaintiff’s alternative construction: structure: “an object detection sensor that generates a range signal corresponding to a distance between the vehicle and a target, and equivalents thereof and an object detection sensor that generates the angle of the target relative to the vehicle, and equivalents thereof”

- b. *Defendants’ proposed construction:* this term is a means-plus-function limitation; *function:* “generating an object range signal corresponding to a distance between the vehicle and the object; and an object angle signal corresponding to the object’s angle in relation to the vehicle”; *structure:* “sensor 220 functions (i) for generating a range signal corresponding to a distance between host vehicle 200 and a target, and (ii) for generating the angle of the target relative to the vehicle, and equivalents thereof”

- c. *Court’s construction:* this term is not a means-plus-function limitation because sufficient structure is provided within the claim

Claim 11 recites, “The system of claim 10 wherein said object detection sensor includes means for generating” Since this claim uses the word “means,” there is a rebuttable presumption that § 112, ¶ 6 applies. I find that this presumption has been overcome because claim 11 articulates a sufficient structure for performing the claimed function: the object detection sensor.

Plaintiff’s evidence shows that an object detection sensor was a well-known structure in the field of adaptive cruise control for automobiles at the time of invention. (See D.I. 88 at Appx16–18). For example, engineering texts contemporaneous with the ’416 patent’s priority date define sensors as physical “devices.” (See, e.g., *id.* at Appx117, Oxford Essential Dictionary (2003) (defining “sensor” as a “device for the detection or measurement of a physical property to which it responds”); Appx121, The Oxford American Dictionary and Thesaurus (2003) (defining “sensor” as “a device giving a signal for the detection or measurement of a physical property to which it responds”)).

The ’416 patent specification also shows that an object detection sensor is a sufficiently definite structure as the specification describes an object detection sensor as a physical device that performs the claimed functionality. (See ’416 patent, Fig 2; 4:23–27 (“System 210 also includes sensor 220 for generating a range signal corresponding to a distance between host vehicle 200 and a target, and a target range rate signal corresponding to a rate that the distance between host vehicle 200 and the target is changing.”)).

Defendants argue that claim 11 fails to recite a sufficient structure as it does not identify the sub-component within the object detection sensor that performs the claimed function. (D.I.

87 at 15–16).³ I do not think the Federal Circuit requires this level of specificity. The Court just requires that the claim recites a structure that performs the claimed function, which here is the object detection sensor. *See, e.g., Personalized Media Commc'ns, LLC v. Int'l Trade Comm'n*, 161 F.3d 696, 705 (finding that the term “detector” is a “sufficiently definite structural term to preclude the application of §112, ¶ 6”); *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1300 (Fed. Cir. 2014) (overruled on other grounds) (“The limitation need not connote a single, specific structure; rather, it may describe a class of structures.”). Regardless, Defendants’ proposed structure—“sensor 220”—fails to add any additional structure beyond the object detection sensor. (*See* ’416 patent, 4:42–46 (“Sensor 220 may include any object detecting sensor known in the art, including a radar sensor (e.g., doppler or microwave radar), a laser radar (LIDAR) sensor, an ultrasonic radar, a forward looking IR (FLIR), a stereo imaging system, or a combination of a radar sensor and a camera system.”)).

Thus, I find that the “means for generating” term in claim 11 is not a means-plus-function limitation, as claim 11 recites a sufficiently definite structure for performing the claimed function—object detection sensor. The parties have not argued for specific constructions in the event that the term is not construed as a means-plus-function limitation. Thus, I will stop my analysis here.

³ At first look, the language of the claim appears to support this theory. (*See, e.g.*, ’416 patent, claim 11 (“[S]aid object detection sensor *includes* means for generating” (emphasis added))). But Plaintiff clarified at oral argument that the word “includes” only appears in claim 11 because claim 11 depends from claim 10. (Tr. at 14:11–14). Claim 10 recites: “A system for use in controlling a vehicle at a vehicle speed, said system including: . . . at least one object detection sensor” Thus, dependent claim 11 uses the language “said object detection sensor includes means”—rather than the typical “object detection sensor means”—to show that the object detection sensor in claim 10 can perform additional functions. (*Id.* at 13:4–23).

2. **“means for measuring an object range rate corresponding to the rate in which the distance between the vehicle and the object is changing” (claim 12)**

a. *Plaintiff’s proposed construction:* this term is not a means-plus-function limitation because sufficient structure is provided within the claim

Plaintiff’s alternative construction: structure: “a controller that uses data to determine an object range rate corresponding to the rate in which the distance between the vehicle and the object is changing and equivalents thereof”

b. *Defendants’ proposed construction:* this term is a means-plus-function limitation; **function:** “measuring an object range rate corresponding to the rate in which the distance between the vehicle and the object is changing”; **structure:** “sensor 220 functions for generating a target range rate signal corresponding to a rate that the distance between host vehicle 200 and the target is changing, and equivalents thereof”

c. *Court’s construction:* this term is not a means-plus-function limitation because sufficient structure is provided within the claim

3. **“means for determining a curvature corresponding to a radius of curvature of the vehicle path” (claim 12)**

a. *Plaintiff’s proposed construction:* this term is not a means-plus-function limitation because sufficient structure is provided within the claim

Plaintiff’s alternative construction: structure: “a controller that uses data from vehicle sensors to determine the radius of curvature, and equivalents thereof”

b. *Defendants’ proposed construction:* this term is a means-plus-function limitation; **function:** “determining a curvature corresponding to a radius of curvature of the vehicle path”; **structure:** “controller 222 using data obtained from vehicle 302 to determine a radius of curvature, and equivalents thereof”

c. *Court’s construction:* this term is not a means-plus-function limitation because sufficient structure is provided within the claim

Terms 2 and 3 both appear in claim 12 and refer to the same structure. Thus, I combine my discussion of the terms below.

Claim 12 recites, “The system of claim 11 wherein said controller includes both means for measuring . . . and means for determining . . .” Since this claim uses the word “means,” there is a rebuttable presumption that § 112, ¶ 6 applies. While the “means” term in claim 12

presents a closer case than the “means” term in claim 11, I agree with Plaintiff that claim 12 articulates a sufficient structure for performing the claimed functions—the controller—as to overcome this presumption.

Plaintiff’s expert Dr. Gregory Shaver explains, “A controller is a device that evaluates incoming signals, using logic to make a decision about those signals, and transmits one or more outputs.” (D.I. 88 at Appx18, ¶ 30). Plaintiff’s evidence supports the finding that a controller was a well-known physical structure in the art. (*See id.* at Appx19–20, ¶¶ 32–35). For example, engineering texts contemporaneous with the ’416 patent’s priority date show that persons of skill in the art generally understood a controller to be a physical structure. (*See id.* at Appx50, Thomas A. Hughes, *Measurement and Control Basics* (3d ed. 2002) (“A device called a controller performs this evaluation. The controller can be a pneumatic, electronic, or mechanical device mounted in a control panel or on the process equipment.”); Appx93, *Bosch Automobile Handbook* (6th ed. 2004) (“[Electronic control units] developed for use in motor vehicles all have a similar design. Their structure can be subdivided in the conditioning of input signals, the logic processing of these signals in the microcomputer, and the output of logic and power levels as regulation or control signals (see figure.”); Appx281, Shigeo Uno et al., *Sophisticated CAN on Embedded Microcontrollers for Smart In-Vehicle Real-Time Control Systems*, Fig. 8 (2001) (depicting the control unit (controller) as a structural component of a vehicle’s ACC system)).

The ’416 specification also treats the controller as a physical structure and ties it to the claimed functionality. (*See, e.g.*, ’416 patent, Fig. 2; 4:27–29; 4:66–5:4; 6:1–11; 7:14–29). For the “means for determining a curvature” term in claim 12, Defendants’ proposed structure is “controller 222.” By proposing the controller as the structure, Defendants essentially concede that a controller is a known structure that performs the claimed function. (*See, e.g.*, Tr. at 33:12–

14 (“I don’t believe there’s really a dispute between the parties that the controller is performing that function.”)).

Thus, I find that the “means for measuring” and “means for determining” terms in claim 12 are not means-plus-function limitations, as claim 12 recites a sufficiently definite structure for performing the claim’s functions—the controller. The parties have not argued for specific constructions in the event that the terms are not construed as means-plus-function limitations. Thus, I do not further construe the terms.

IV. CONCLUSION

Within five days the parties shall submit a proposed order consistent with this Memorandum Opinion.